

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

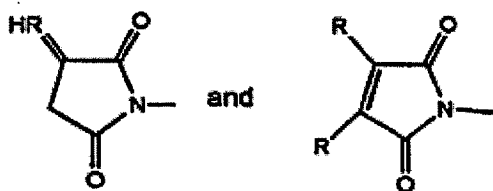
LISTING OF CLAIMS:

1-32. (canceled).

33. (currently amended): A polymerisation process for forming ~~a compound which is a conjugate of a polymer and a biologically active moiety~~polymer conjugates of biologically active compounds in which ethylenically unsaturated monomers including a zwitterionic monomer of the general formula I



in which Y is an ethylenically unsaturated group selected from $\text{H}_2\text{C}=\text{CR}-\text{CO}-\text{A}-$, $\text{H}_2\text{C}=\text{CR}-\text{C}_6\text{H}_4-\text{A}^1-$, $\text{H}_2\text{C}=\text{CR}-\text{CH}_2\text{A}^2$, $\text{R}^2\text{O}-\text{CO}-\text{CR}=\text{CR}-\text{CO}-\text{O}$, $\text{RCH}=\text{CH}-\text{CO}-\text{O}-$, $\text{RCH}=\text{C}(\text{COOR}^2)\text{CH}_2-\text{CO}-\text{O}$,



A is $-\text{O}-$ or NR^1 ;

A^1 is selected from the group consisting of a bond, $(\text{CH}_2)_n\text{A}^2$ and $(\text{CH}_2)_n\text{SO}_3-$ in which n is 1 to 12;

A^2 is selected from the group consisting of a bond, $-\text{O}-$, $\text{O}-\text{CO}-$, $\text{CO}-\text{O}$, $\text{CO}-\text{NR}^1-$, $-\text{NR}^1-\text{CO}$, $\text{O}-\text{CO}-\text{NR}^1-$, $\text{NR}^1-\text{CO}-\text{O}-$;

R is hydrogen or C_{1-4} alkyl;

R^1 is selected from the groups consisting of hydrogen, C_{1-4} alkyl or BX ;

R^2 is hydrogen or C_{1-4} alkyl;

B is selected from the group consisting of a bond, or a straight and branched alkanediyl, alkylene oxaalkylene, and alkylene (oligooxalkylene) groups, optionally containing one or more fluorine substituents; and

X is a zwitterionic group

are polymerised by a living radical polymerisation process in the presence of an initiator, and a catalyst;

in which the initiator is a compound of general formula V



where:

Y^1 is selected from the group consisting of Cl , Br , I , OR^{10} , SR^{14} , SeR^{14} , $OP(=O)R^{14}$, $OP(=O)(OR^{14})_2$, $O-N(R^{14})_2$ and $S-C(=S)N(R^{14})_2$, where R^{10} is alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R^{14} is aryl or a straight or branched C_1 - C_{20} alkyl group, and where an $N(R^{14})_2$ group is present, the two R^{14} groups may be joined to form a 5- or 6-membered heterocyclic ring;

R^{11} and R^{12} are each independently selected from the group consisting of H , halogen, C_1 - C_{20} alkyl, C_3 - C_8 cycloalkyl, $C(=O)R^{15}$, $C(=O)NR^{16}R^{17}$, $COCl$, OH , CN , C_2 - C_{20} alkenyl, oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl and aralkenyl, in any of which the alkyl, alkenyl or aryl, heterocyclyl or cycloalkyl groups there may be from 1 to 3 substituents selected from the group consisting of hydrogen, hydroxy C_1 - C_4 alkoxy, acyloxy, aryl, heterocyclyl, $C(=O)R^{15}$, $C(=O)NR^{16}R^{17}$, $-CR^{12}R^{13}Y^1$, $CR^{11}R^{12}Y^1$, oxiranyl and glycidyl;

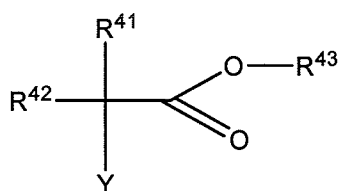
where R^{15} is selected from the group consisting of alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, oligo(alkoxy) in which each alkoxy group has 1 to 3 carbon atoms, aryloxy and heterocyclyloxy groups any of which groups may have substituents selected from the group consisting of optionally substituted alkoxy, oligoalkoxy, amino (including mono-[[-]] and di-alkyl amino and trialkyl ammonium, which alkyl groups, in turn may have substituents selected from acyl, acyloxy, alkoxy, alkoxycarbonyl, alkenoxycarbonyl, aryl and hydroxy), and hydroxyl groups;

R^{16} and R^{17} are independently selected from the group consisting of H and alkyl of from 1 to 20 carbon atoms which alkyl groups, in turn may have substituents selected from the group consisting of alkoxy, acyl, acyloxy, alkoxycarbonyl, alkenoxycarbonyl, aryl and hydroxy, or R^{16} and R^{17} may be joined together to form an alkanediyl group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring; and

R^{13} is selected from the group consisting of biologically active group-substituted alkyl, cycloalkyl, $-\text{COR}^{15}$, $-\text{CONR}^{16}\text{R}^{17}$, alkenyl, aryl, heterocyclyl, aralkyl and aralkenyl groups, in any of which the alkyl, alkenyl, aryl, heterocyclyl or cycloalkyl groups may have from 1 to 3 substituents selected from the group consisting of hydrogen, hydroxy, $\text{C}_1\text{-C}_4$ alkoxy, acyloxy, aryl, heterocyclyl, $\text{C}(=\text{O})\text{R}^{15}$, $\text{C}(=\text{O})\text{NR}^{16}\text{R}^{17}$, $-\text{CR}^{12}\text{R}^{13}\text{Y}^1$, $\text{CR}^{11}\text{R}^{12}\text{Y}^1$, oxiranyl and glycidyl where R^{15} , R^{16} and R^{17} are groups as defined above for R^{11} and R^{12} with the biologically active group substituted on an alkyl, cycloalkyl, alkenyl, aryl or heterocyclyl group, and

wherein, in the living radical polymerization process, the group Y^1 is removed to form a radical on the carbon atom to which it is linked in the initiator compound.

34. (currently amended): A process according to claim 33 in which the initiator is a compound of general formula VI



VI

where R⁴¹ and R⁴² are independently selected from hydrogen, straight, branched and cyclic alkyl, aryl, aralkyl, hydroxy-alkyl and acyloxyalkyl[.];

OR⁴³R⁴³ is a biologically active moiety which has the same definition as R¹³ in claim 33 selected from the group consisting of an alkoxy of from 1 to 20 carbon atoms, an aryloxy and a heterocycloxy, having a biological active substituent; and

Y has the same definition as Y¹ in formula V of claim 33.

35. (previously presented): A process according to claim 34 in which either

- a) R⁴¹ and R⁴² are each methyl; or
- b) R⁴¹ is hydrogen and R⁴² is methyl.

36. (previously presented): A process according to claim 33 in which a biologically active moiety is a steroid moiety.

37. (previously presented): A process according to claim 34 in which R⁴³ is derived from a pharmaceutically or diagnostically active alcohol R⁴³OH.

38. (withdrawn): A process according to claim 37 in which R⁴³OH is a carbohydrate.

39. (withdrawn): A process according to claim 35 in which R⁴³ is R⁴⁴AL- derived from R⁴⁴ALOH in which R⁴⁴ is derived from a pharmacologically or diagnostically active compound R⁴⁴AH where A is a divalent moiety selected from the group consisting of O, NR³⁵ (R³⁵ is H or lower alkyl), COO and CONR³⁵, and L is a divalent linker.

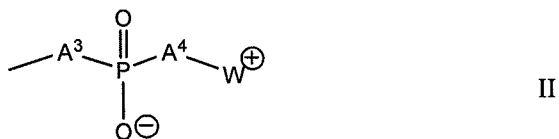
40. (withdrawn): A process according to claim 39 in which L is an oligo-peptide-based linker.

41. (previously presented): A process according to claim 33 in which the product polymer has a molecular weight in the range 1000 to 100,000.

42. (previously presented): A process according to claim 33 in which the product polymer has a polydispersity less than 1.5.

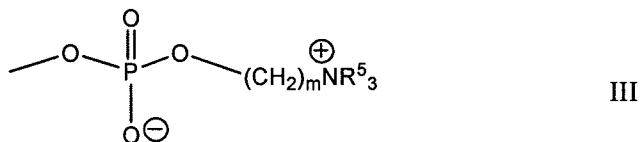
43. (previously presented): A process according to claim 33 in which X is an ammonium, phosphonium, or sulphonium phosphate or phosphonate ester zwitterionic group.

44. (previously presented): A process according to claim 43 in which X is a group of the general formula II



in which the moieties A³ and A⁴, which are the same or different, are -O-, -S-, -NH- or a valence bond and W⁺ is a group comprising an ammonium, phosphonium or sulphonium cationic group and a group linking the anionic and cationic moieties which is a C₁₋₁₂-alkanediyl group.

45. (previously presented): A process according to claim 44 in which X is a group of general formula III



where the groups R⁵ are the same or different and each is hydrogen or C₁₋₄ alkyl, and m is from 1 to 4.

46. (previously presented): A process according to claim 33 in which Y is H₂C=CR-CO-A- in which R is hydrogen or methyl and A is O.

47. (previously presented): A polymerisation process according to claim 33 in which B is a straight chain C₂₋₆-alkanediyl.

48. (previously presented): A polymerisation process according to claim 33 in which the zwitterionic monomer is 2-methacryloyloxyethyl-2'- trimethylammonium ethyl phosphate inner salt.

49. (previously presented): A polymerisation process according to claim 33 in which the polymerisation mixture contains a non-polymerisable solvent, in an amount, in the range of 10 to 500% by weight based on the weight of ethylenically unsaturated monomer.

50. (previously presented): A polymerisation process according to claim 33 in which the ethylenically unsaturated monomer includes at least one comonomer, selected from anionic, cationic and non-ionic monomers and mixtures thereof.

51. (previously presented): A polymerisation process according to claim 33 in which the catalyst comprises a transition metal compound and a ligand, in which the transition metal compound is capable of participating in a redox cycle with the initiator and dormant polymer chain, and the ligand is either any N-, O-, P- or S- containing compound which can coordinate with the transition metal atom in a σ -bond, or any carbon-containing compound which can coordinate with the transition metal in a π -bond, such that direct bonds between the transition metal and growing polymer radicals are not formed.

52. (previously presented): A polymerisation process according to claim 51 in which the transition metal compound has the formula $M_t^{n+}X'_n$, where:

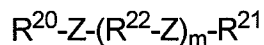
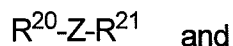
M_t^{n+} may be selected from the group consisting of Cu¹⁺, Cu²⁺, Fe²⁺, Fe³⁺, Ru²⁺, Ru³⁺, Cr²⁺, Cr³⁺, Mo²⁺, Mo³⁺, W²⁺, W³⁺, Mn²⁺, Mn³⁺, Mn⁴⁺, Rh³⁺, Rh⁴⁺, Re²⁺, Re³⁺, Co⁺, Co²⁺, Co³⁺, V²⁺, V³⁺, Zn⁺, Zn²⁺, Ni²⁺, Ni³⁺, Au⁺, Au²⁺, Ag⁺ and Ag²⁺;

X' is selected from the group consisting of halogen, C₁₂-C₆-alkoxy, (SO₄)_{1/2}, (PO₄)_{1/3}, (R¹⁸PO₄)_{1/2}, (R¹⁸₂PO₄), triflate, hexafluorophosphate, methanesulphonate, arylsulphonate, CN and R¹⁹CO₂, where R¹⁸ is aryl or a straight or branched C₁₋₂₀ alkyl and R¹⁹ is H or a straight or branched C₁-C₆ alkyl group which may be substituted from 1 to 5 times with a halogen; and
n is the formal charge on the metal (0 ≤ n ≤ 7).

53. (previously presented): A polymerisation process according to claim 52 in which the metal compound is CuHal or RuHal₂ where Hal is chlorine or bromine.

54. (previously presented): A polymerisation process according to claim 51 wherein said ligand is selected from the group consisting of:

a) compounds of the formulas:



where:

R²⁰ and R²¹ are independently selected from the group consisting of H, C₁-C₂₀ alkyl, aryl, heterocyclyl, C₁-C₆ alkoxy, C₁-C₄ dialkylamino, C(=O)R²², C(=O)R²³R²⁴ and A⁷C(=O)R²⁵, where A⁷ may be NR²⁶ or O; R²² is alkyl of from 1 to 20 carbon atoms, aryloxy or heterocyclyloxy; R²³ and R²⁴ are independently H or alkyl of from 1 to 20 carbon atoms or R²³ and R²⁴ may be joined together to form an alkanediyl group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring; R²⁵ is H, straight or branched C₁-C₂₀ alkyl or aryl and R²⁶ is hydrogen, straight or branched; C₁₋₂₀-alkyl or aryl; or R²⁰ and R²¹ may be joined to form together with Z, a saturated or unsaturated ring;

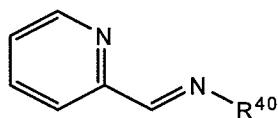
Z is O, S, NR^{27} or PR^{27} , where R^{27} is selected from the same group as R^{20} and R^{21} , and where Z is PR^{27} , R^{27} can also $\text{C}_1\text{-C}_{20}$ alkoxy or Z may be a bond CH_2 or a fused ring, where one or both of R^{20} and R^{23} is heterocyclyl,

each R^{22} is independently a divalent group selected from the group consisting of $\text{C}_1\text{-C}_8$ cycloalkanediyl, $\text{C}_1\text{-C}_8$ cycloalkanediyl, arenediyl and heterocyclylene where the covalent bonds to each Z are at vicinal positions or R^{22} may be joined to one or both of R^{20} and R^{21} to formulate a heterocyclic ring system; and

m is from 1 to 6;

- b) CO;
- c) porphyrins and porphycenes, which may be substituted with from 1 to 6 halogen atoms, C_{1-6} alkyl groups, C_{1-6} -alkoxy groups, C_{1-6} alkoxycarbonyl, aryl groups, heterocyclyl groups, and C_{1-6} alkyl groups further substituted with from 1 to 3 halogens;
- d) compounds of the formula $\text{R}^{23}\text{R}^{24}\text{C}(\text{C}(=\text{O})\text{R}^{25})_2$, where R^{25} is C_{1-20} alkyl, C_{1-20} alkoxy, aryloxy or heterocyclyoxy; and each of R^{23} and R^{24} is independently selected from the group consisting of H, halogen, C_{1-20} alkyl, aryl and heterocyclyl, and R^{23} and R^{24} may be joined to form a C_{1-8} cycloalkyl ring or a hydrogenated aromatic or heterocyclic ring, of which the ring atoms may be further substituted with 1 to 5 C_{1-6} alkyl groups, C_{1-6} alkoxy groups, halogen atoms, aryl groups, or combinations thereof; and
- e) arenes and cyclopentadienyl ligands, where said cyclopentadienyl ligand may be substituted with from one to five methyl groups, or may be linked through and ethylene or propylene chain to a second cyclopentadienyl ligand.

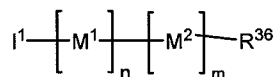
55. (previously presented): A polymerisation process according to claim 54 in which the ligand is selected from the group consisting of bipyridine, triphenylphosphine, 1,1,4,7,10,10-hexamethyl-triethylene tetramine, or a compound of the general formula VII



VII

where R^{40} is an alkyl or substituted alkyl group, in which the substituent is selected from amino, including alkylamino and acylamino, alkoxy, hydroxy, acyl, acyloxy, alkoxycarbonyl, heterocyclyl, ionic groups and halogen.

56. (withdrawn): A compound comprising a conjugate of a biologically active moiety and a polymeric group having a general formula:

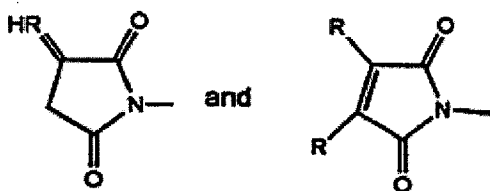


VIII

in which M^1 is the divalent group formed when the compound of the general formula I



in which Y is an ethylenically unsaturated group selected from $H_2C=CR-CO-A-$, $H_2C=CR-C_6H_4-A^1-$, $H_2C=CR-CH_2A^2$, $R^2O-CO-CR=CR-CO-O$, $RCH=CH-CO-O-$, $RCH=C(COOR^2)CH_2-CO-O$,



A is $-O-$ or NR^1 ;

A^1 is selected from the group consisting of a bond, $(CH_2)_n A^2$ and $(CH_2)_n SO_3^-$ in which n is 1 to 12;

A^2 is selected from the group consisting of a bond, -O-, O-CO-, CO-O, CO-NR¹-, -NR¹-CO, O-CO-NR¹-, NR¹-CO-O-;

R is hydrogen or C₁₋₄ alkyl;

R¹ is selected from the groups consisting of hydrogen, C₁₋₄ alkyl or BX;

R² is hydrogen or C₁₋₄ alkyl;

B is selected from the group consisting of a bond, or a straight and branched alkanediyl, alkylene oxaalkylene, and alkylene (oligooxalkylene) groups, optionally containing one or more fluorine substituents; and

X is a zwitterionic group is polymerised, M² is the divalent group formed when an ethyleneically unsaturated comonomer selected from amino, cationic and non-ionic monomers is polymerised, and I¹ is the residue of a initiator of general formula V



where:

Y¹ is selected from the group consisting of Cl, Br, I, OR¹⁰, SR¹⁴, SeR¹⁴, OP(=O)R¹⁴, OP(=O)(OR¹⁴)₂, O-N(R¹⁴)₂ and S-C(=S)N(R¹⁴)₂, where R¹⁰ is alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R¹⁴ is aryl or a straight or branched C₁-C₂₀ alkyl group, and where an N(R¹⁴)₂ group is present, the two R¹⁴ groups may be joined to form a 5- or 6-membered heterocyclic ring;

R¹¹ and R¹² are each independently selected from the group consisting of H, halogen, C₁-C₂₀ alkyl, C₃-C₈ cycloalkyl, C(=O)R¹⁵, C(=O)NR¹⁶R¹⁷, COCl, OH, CN, C₂-C₂₀ alkenyl, oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl and aralkenyl, in any of which the alkyl, alkenyl or aryl,

heterocyclyl or cycloalkyl groups there may be from 1 to 3 substituents selected from the group consisting of hydrogen, hydroxy C₁-C₄ alkoxy, acyloxy, aryl, heterocyclyl, C(=O)R¹⁵, C(=O)NR¹⁶R¹⁷, -CR¹²R¹³Y¹, CR¹¹R¹²Y¹, oxiranyl and glycidyl;

where R¹⁵ is selected from the group consisting of alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, oligo(alkoxy) in which each alkoxy group has 1 to 3 carbon atoms, aryloxy and heterocyclyloxy groups any of which groups may have substituents selected from the group consisting of optionally substituted alkoxy, oligoalkoxy, amino (including mono-- and di-alkyl amino and trialkyl ammonium, which alkyl groups, in turn may have substituents selected from acyl, acyloxy, alkoxy, alkoxycarbonyl, alkenoxycarbonyl, aryl and hydroxy), and hydroxyl groups;

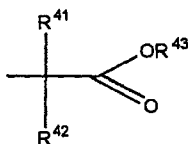
R¹⁶ and R¹⁷ are independently selected from the group consisting of H and alkyl of from 1 to 20 carbon atoms which alkyl groups, in turn may have substituents selected from the group consisting of alkoxy, acyl, acyloxy, alkoxycarbonyl, alkenoxycarbonyl, aryl and hydroxy, or R¹⁶ and R¹⁷ may be joined together to form an alkanediyl group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring; and

R¹³ is selected from the group consisting of biologically active group-substituted alkyl, cycloalkyl, -COR¹⁵, -CONR¹⁶R¹⁷, alkenyl, aryl, heterocyclyl, aralkyl and aralkenyl groups, in any of which the alkyl, alkenyl, aryl, heterocyclyl or cycloalkyl groups may have from 1 to 3 substituents selected from the group consisting of hydrogen, hydroxy, C₁-C₄ alkoxy, acyloxy, aryl, heterocyclyl, C(=O)R¹⁵, C(=O)NR¹⁶R¹⁷, -CR¹²R¹³Y¹, CR¹¹R¹²Y¹, oxiranyl and glycidyl where R¹⁵, R¹⁶ and R¹⁷ are groups as defined above for R¹¹ and R¹² with the biologically active group substituted on an alkyl, cycloalkyl, alkenyl, aryl or heterocyclyl group.

which comprises said biologically active moiety, and R^{36} is a monofunctional group or atom which terminates the polymeric group M^1_n , n is at least 2 and m is at least 0.

57. (withdrawn): A compound according to claim 56 in which I^1 is $-CR^{11}R^{12}R^{13}$ in which R^{11} to R^{13} are as defined in claim 56.

58. (withdrawn): A compound according to claim 56 in which I^1 is a group



in which R^{41} and R^{42} are independently selected from hydrogen, straight, branched and cyclic alkyl, aryl, aralkyl, hydroxy-alkyl and acyloxyalkyl.

R^{43} is a biologically active moiety; and

Y as defined in claim 1.

59. ((withdrawn): A compound according to claim 56 in which the compound has a molecular weight in the range 1000 to 100,000.

60. (withdrawn): A compound according to claim 56 which has a polydispersity less than 1.5.

61. (withdrawn): A compound according to claim 56 in which groups M^1 and M^2 are randomly arranged.

62. (withdrawn): A compound according to claim 56 in which the polymeric group is a block polymeric group, in which one block comprises residues M^1 and another block comprises residues M^2 , and in which either the M^1 -containing block, or the M^2 -containing block is attached to I^1 .

63. (withdrawn): A compound according to claim 56 which is soluble in water.

64. (previously presented): A process according to claim 34 in which Y^1 is a halogen atom.

65. (withdrawn): A process according to claim 36 in which the steroid is cholesterol.

66. (withdrawn): A process according to claim 38 in which the carbohydrate is a saccharide.

67. (previously presented): A process according to claim 41 in which the product polymer has a molecular weight in the range 2000 to 50000.

68. (currently amended): A process according to claim 44 in which W^+ is selected from the group consisting of a group of formula

$-W^1-N^+R^3_3$, $-W^1-P^+R^4_3$, $-W^1-S^+R^4_2$ and $-W^1-Het^+$ in which:

W^1 is selected from the group consisting of alkanediyl of 1 or more, preferably 2-6 carbon atoms optionally containing one or more ethylenically unsaturated double or triple bonds, disubstituted-aryl (arylene), alkylene arylene, arylene alkylene, alkylene aryl alkylene, cycloalkanediyl, alkylene cycloalkyl, cycloalkyl alkylene and alkylene cycloalkyl alkylene, which group W^1 optionally contains one or more fluorine substituents and/or one or more functional groups; and

either the groups R^3 are the same or different and each is hydrogen or alkyl of 1 to 4 carbon atoms, preferably methyl, or aryl, such as phenyl, or two of the groups R^3 together with the nitrogen atom to which they are attached form an aliphatic heterocyclic ring containing from 5 to 7 atoms, or the three groups R^3 together with the nitrogen atom to which they are attached form a fused ring structure containing from 5 to 7 atoms in each ring, and optionally one or more of the groups R^3 is substituted by a hydrophilic functional group; and

the groups R^4 are the same or different and each is R^3 or a group OR^3 , where R^3 is as defined above; or

Het is ~~an aromatic~~ a nitrogen-, phosphorus- or sulphur-containing aromatic ring.

69. (previously presented): A process according to claim 45 in which all the groups R^5 are methyl.

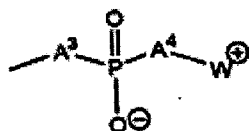
70. (previously presented): A process according to claim 50 in which the comonomer comprises non-ionic monomer.

71. (withdrawn): A compound according to claim 58 in which either

- a) R^{41} and R^{42} are each methyl; or
- b) R^{41} is hydrogen and R^{42} is methyl.

72. (withdrawn): A compound according to claim 58 in which R^{43} is $R^{44}AL$ - derived from $R^{44}ALOH$ in which R^{44} is derived from a pharmacologically or diagnostically active compound $R^{44}AH$ where A is a divalent moiety selected from the group consisting of O, NR^{35} (R^{35} is H or lower alkyl), COO and $CONR^{35}$, and L is a divalent linker.

73. (withdrawn): A compound according to claim 56 in which X is a group of the general formula II



in which the moieties A^3 and A^4 , which are the same or different, are -O-, -S-, -NH- or a valence bond and W^+ is a group comprising an ammonium, phosphonium or sulphonium cationic group and a group linking the anionic and cationic moieties which is a C_{1-12} -alkanediyl group.

74. (withdrawn): A compound according to claim 73 in which W^+ is a group of formula

$-W^1-N^+R^3_3$, $-W^1-P^+R^4_3$, $-W^1-S^+R^4_2$ or $-W^1-Het^+$ in which:

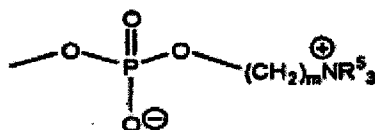
W^1 is selected from the group consisting of alkanediyl of 1 or more, preferably 2-6 carbon atoms optionally containing one or more ethylenically unsaturated double or triple bonds, disubstituted-aryl (arylene), alkylene arylene, arylene alkylene, alkylene aryl alkylene, cycloalkanediyl, alkylene cycloalkyl, cycloalkyl alkylene and alkylene cycloalkyl alkylene, which group W^1 optionally contains one or more fluorine substituents and/or one or more functional groups; and

either the groups R^3 are the same or different and each is hydrogen or alkyl of 1 to 4 carbon atoms, preferably methyl, or aryl, such as phenyl, or two of the groups R^3 together with the nitrogen atom to which they are attached form an aliphatic heterocyclic ring containing from 5 to 7 atoms, or the three groups R^3 together with the nitrogen atom to which they are attached form a fused ring structure containing from 5 to 7 atoms in each ring, and optionally one or more of the groups R^3 is substituted by a hydrophilic functional group; and

the groups R^4 are the same or different and each is R^3 or a group OR^3 , where R^3 is as defined above; or

Het is an aromatic nitrogen-, phosphorus- or sulphur- containing ring.

75. (withdrawn): A compound according to claim 73 in which X is a group of general formula III



III

where the groups R^5 are the same or different and each is hydrogen or C_{1-4} alkyl, and m is from 1 to 4.

76. (withdrawn): A compound according to claim 56 in which Y is $\text{H}_2\text{C}=\text{CR}-\text{CO}-\text{A}-$ in which R is hydrogen or methyl and A is O.

77. (withdrawn): A compound according to claim 56 in which B is a straight chain C_{2-6} - alkanediyl.

78. (withdrawn): A compound according to claim 56 in which the zwitterionic monomer is 2-methacryloyloxyethyl-2'- trimethylammonium ethyl phosphate inner salt.